

	-۵	۰	+۲	+۵
x	-	-	+	+
$f(x)$	+	-	-	+
	-	+	-	+

$$y = \sqrt{x} f(x)$$

$$D_f = [5, 0] \cup [2, 5]$$

۱

	-۳	۰	۲	۵
$-x$	+	+	-	-
$f(x)$	-	+	-	+
	-	+	+	-

$$y = \sqrt{\frac{-x}{f(x)}}$$

$$D_f = (-3, 0) \cup (0, 2) \rightarrow \text{محدوده تعریف} = -3, -1, 1 \rightarrow \boxed{\text{محدوده} = 3}$$

۲

$$f(x) - 2f(2) = x^2 - 2x + 2 \rightarrow f(-2) = 2 + 2 + 2 - 2 = \boxed{10}$$

$$x = 2 \rightarrow -f(2) = 2 \rightarrow f(2) = -2$$

۳

$$f(x) = \begin{cases} x - \sqrt{x+2} & x > 2 \\ 2x + 2 & x \leq 2 \end{cases}$$

$$\left. \begin{array}{l} f\left(\frac{f(5)}{2}\right) = 7 \\ f\left(\frac{f(1)}{5}\right) = 2 \end{array} \right\} \rightarrow \boxed{9}$$

۴

$$f(x) = ax^2 - bx + 2 \quad f(x-1) + f(x) = 7x + 2 \quad a - b = ?$$

$$f(0) = 2$$

$$f(-1) - f(0) = 2 \rightarrow f(-1) = 4 \quad \left. \begin{array}{l} x=1 \\ (a+b=2) \end{array} \right\} \rightarrow -2a - 2b = -4$$

$$f(-2) - f(-1) = -4 \rightarrow f(-2) = 0 \quad \left. \begin{array}{l} x=-1 \\ 4a+2b=-2 \end{array} \right\}$$

$$2a = -4$$

$$a = -2 \rightarrow b = 4 \rightarrow a - b = \boxed{-6}$$

۵

$$f(x) = x^r - rx + 1$$

$$\frac{rf(r) + f(-1)}{f'(r)} = \frac{r+2}{(-1)^r} = \boxed{+V}$$

6

$$f(x) = \begin{cases} rx+1 & x \geq r \\ x^r & x < r \end{cases}$$

$$\frac{rf(r) - rf(-r)}{f(r)} = \frac{r^2 - 1}{r} = \boxed{\frac{r-1}{r}}$$

7

$$f = \{(r, 4), (r, 1), (1, 4)\}$$

$$\frac{f(f(r)) - f(f(r))}{f(r)} = \frac{f(1) - f(r)}{r} = \frac{4-4}{r} = \boxed{0}$$

8

$$f(x) = \frac{x^r + rx + 9}{x^r + rx + 2}$$

$$\frac{r+r - \cancel{r\sqrt{r}} + \cancel{r\sqrt{r}} - 1 + 9}{r+r - \cancel{r\sqrt{r}} + \cancel{r\sqrt{r}} - 1 + 2} = \frac{8}{1} = \boxed{8}$$

$$f(f(\sqrt{r}-1)) = \frac{r}{12}$$

$$\frac{r+1+9}{r+1+2} = \boxed{\frac{r}{12}}$$

9

$$f(x) = x^r + \frac{1}{x^r}$$

$$(f(\sqrt{x}))^r - f(x) = \boxed{r}$$

$$(x + \frac{1}{x})^r - f(\frac{1}{x^r} + x^r) = r$$

10